SEEBURG®

"100" PHONOGRAPH

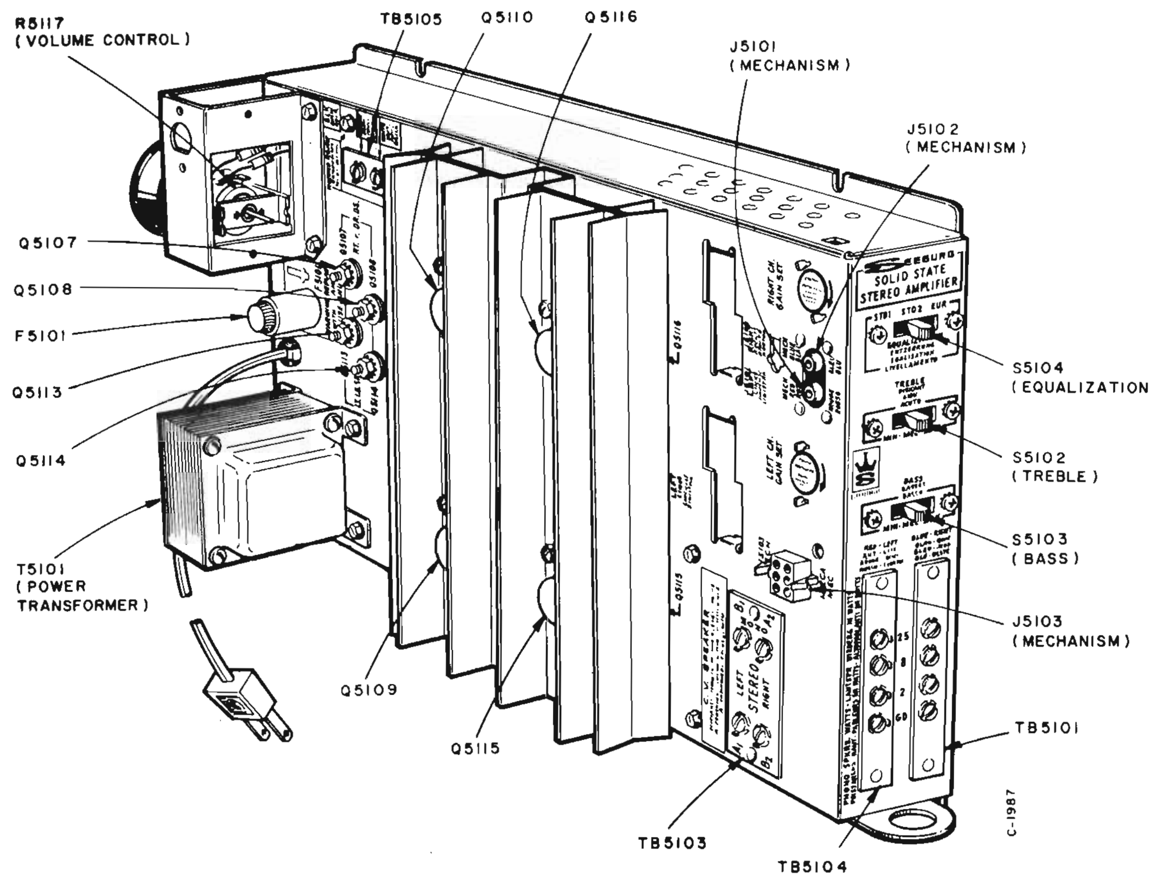
ELECTRONIC UNITS
SERVICE MANUAL

AMPLIFIER	Type TSA9
CONTROL CENTER	Type SCC9
ELECTRICAL SELECTOR	Type TESI12
SINGLE PRICING UNIT	Type SPU5

81-319374

THE SEEBURG CORPORATION, CHICAGO. ILLINOIS 60622 U. S. A.

SOLID STATE STEREO AMPLIFIER, Type TSA9



This is an all-transistor, dual channel stereo amplifier featuring low distortion and wide frequency range. It is part of the Seeburg stereo sound system which includes the Seeburg stereo pickup and cabinet mounted speakers.

The two output signals of the low impedance magnetic pickup of the Select-O-Matic Mechanism are connected to the amplifier througn separate input plugs and have a nominal level of 5 millivolts.

The amplifier is equipped with 3-positions Bass and Treble controls and a pre-set Scratch Compensator.

Automatic volume compensation (A.V.C.) is incorporated to compensate for variations in the cutting levels of different records. This makes is possible to set the volume control for normal records without danger of "blasting" or high volume due to exceptionally loud records.

The output of the A.V.C. amplifier transistor Q5105 is rectified by diodes CR5108 and CR5109. The resultant DC voltage is applied to two pairs of matched diodes CR5106 and CR5107. Varying the bias of these diodes varies the impedance of the circuit and controls the

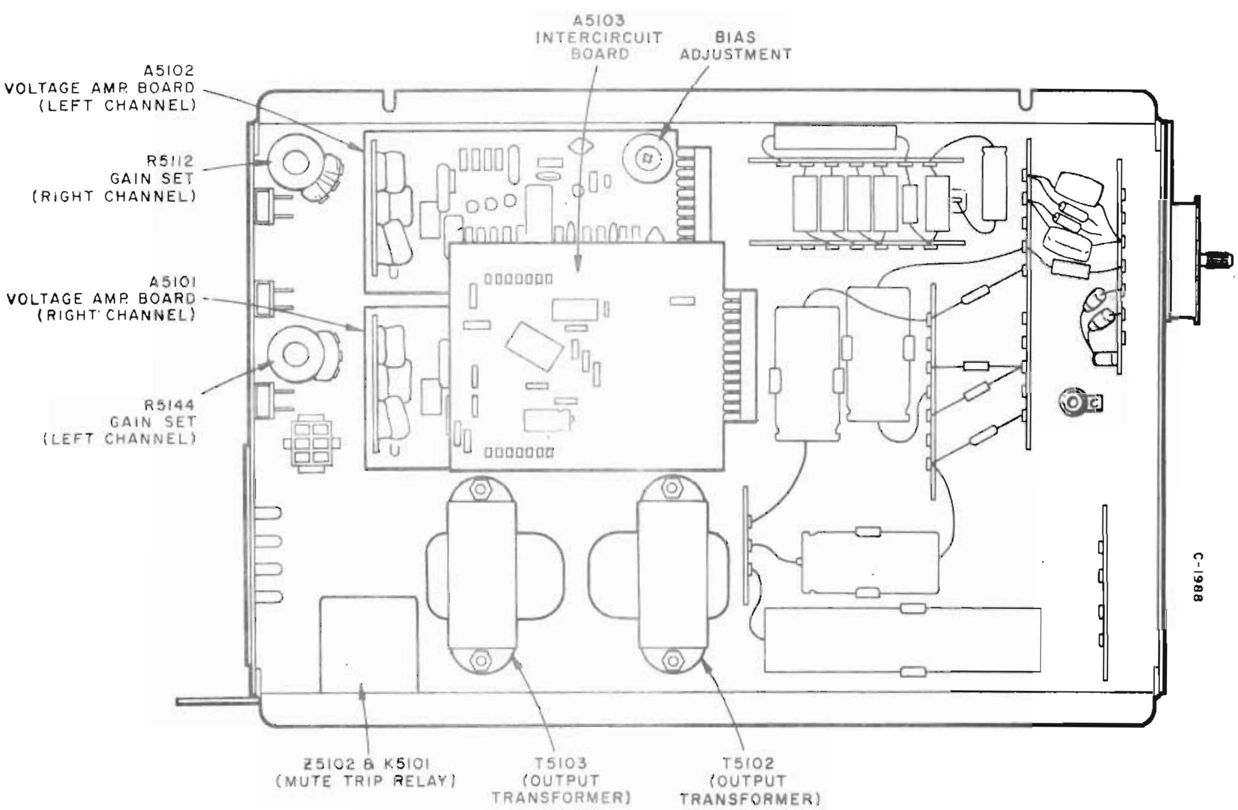
signal level at the base of the amplifier transistor Q5103.

The diodes CR5104 and CR5105 are also part of a "squelch" circuit incorporated in the A.V.C. system to quieten the amplifier during record transfer operations. This is controlled by a contact on the Mute-Trip Relay K5101.

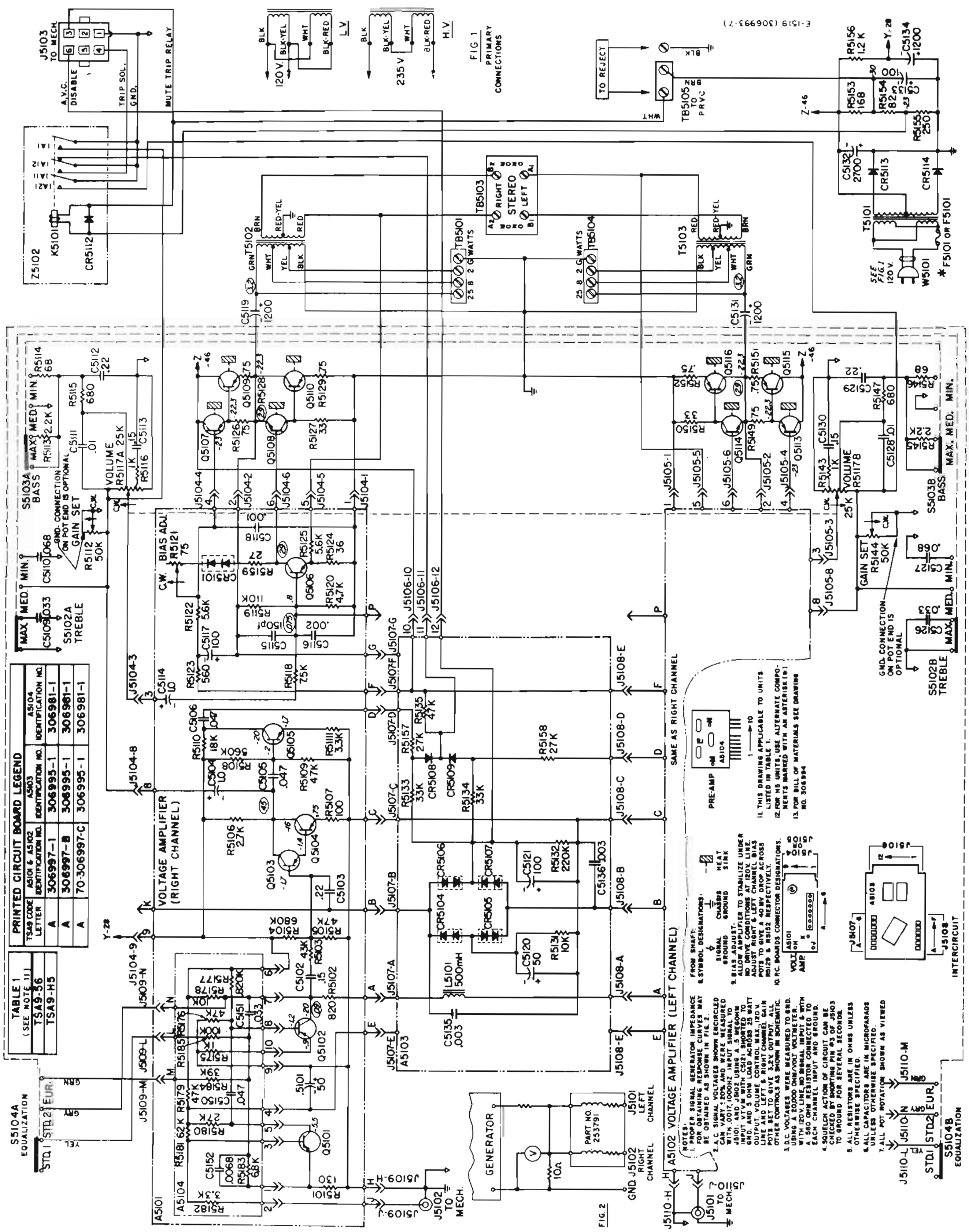
The output stages are coupled to the 12 inch full range speakers and two (2) Hi-frequency horns via the output transformer T5102, T5103, and Terminal Board TB5101 and TB5104.

The impedance of each speaker is approximately 5 ohms and, match the 5 ohm impedance of the amplifier. This impedance presents the maximum permissible 25 watt loading. Provision is also made for connecting Seeburg C.V. speakers to the amplifier.

The volume control adjusts the level of sound from the cabinet speakers and any remote speakers. It is so located that it is accessible from the rear of the cabinet. Remote control of volume may be accomplished by installation of powered remote volume control, type PRVC3, part #509210.



SOLID STATE STEREO AMPLIFIER, Types TSA9-56 & TSA9-H5



SOLID STATE STEREO AMPLIFIER, Types TSA9-56 & TSA9-H5

Item	Part No.	Description
A5101	70-306997	Voltage Amp. Board Assem.
A5102	70-306997	Voltage Amp. Board Assem.
A5103	70-306995	Intercircuit Board Assem.
A5104	70-306981	Pre-Amp Network
C5101	52-87703	50, 12 V., Lytic
C5102	52-86303	.15, 50 V., Mylar
C5103	52-86331	.22, 50 V., Mylar
C5104	52-87754	1.0, 35 V., Tantalum
C5105	52-86327	.047, 50 V., Mylar
C5106	52-86327	.047, 50 V., Mylar
C5109	52-86336	.033, 50 V., Mylar
C5110	52-86351	.068, 50 V., Mylar
C5111	52-86313	.01, 500 V., Ceramic
C5112	52-86331	.22, 50 V., Mylar
C5113	52-86303	.15, 50 V., Mylar
C5114	52-87754	1.0, 35 V., Tantalum
C5115	52-86243	150 PFD, 500 V.,Ceramic
C5116	52-86255	.002, 500 V., Ceramic
C5117	52-87700	100, 35 V., Lytic
C5118	52-86309	.001, 500 V., Ceramic
C5119	52-87726	1200, 35 V., Lytic
C5120	52-87696	50, 6 V., Lytic
C5121	52-87724	100, 12 V., Lytic
C5126	52-86336	.033, 50 V., Mylar
C5127	52-86351	.068, 50 V., Mylar
C5128	52-86313	.01, 500 V., Ceramic
C5129	52-86331	.22, 50 V., Mylar
C5130	52-86303	.15, 50 V., Mylar
C5131	52-87726	1200, 35 V., Lytic
C5132	52-87748	2700, 50 V., Lytic
C5133	52-87700	100, 35 V., Lytic
C5134	52-87726	1200, 35 V., Lytic
C5135	52-86278	.003, 500 V., Ceramic
C5136	52-86278	.003, 500 V., Ceramic
C5150	52-86327	.047, 50 V., Mylar
C5151	52-86336	.033, 50 V., Mylar
C5152	52-86332	.0068, 50 V., Mylar
CR5101	62-309478	Silicon Stabistor
CR5104	62-309463	Silicon Stabistor
CR5105	62-309463	Silicon Stabistor
CR5106	62-309463	Silicon Stabistor
CR5107	62-309463	Silicon Stabistor
CR5108	62-309481	Silicon Diode, 40 PIV
CR5109	62-309481	Silicon Diode, 40 PIV

Item	Part No.	Description
CR5112	62-309384	Silicon Diode, 170 PIV (Part of Z5102)
CR5113	62-309477	Silicon Rectifier,200 PIV
CR5114	62-309477	Silicon Rectifier,200 PIV
F5101	45-306316	8/10 Amp. Slow Blow
**F5101	45-306369	5/10 Amp. Slow Blow
J5101	73-306916	Input Socket
J5102	73-306916	Input Socket
J5103	73-309355	Part of Cable Assembly
J5104	73-309307	9 Pos. Edge Connector
J5105	73-309307	9 Pos. Edge Connector
J5106	73-309308	12 Pos. Edge Connector
J5107	72-941851	Pt.of P.C. Board Assem.
J5108	72-941851	Pt.of P.C. Board Assem.
J5109	73-132054	Receptacle
J5110	73-132054	Receptacle
K5101	44-306914	Mute Trip Relay (Part of Z5102)
L5101	53-306792	500 MH Inductor
Q5101	61-309436	PNP
Q5102	61-309436	PNP
Q5103	61-309436	PNP
Q5104	61-309436	PNP
Q5105	61-309436	PNP
Q5106	61-309437	PNP
Q5107	61-309429	PNP
Q5108	61-309430	NPN
Q5109	61-309412	PNP Power
Q5110	61-309412	PNP Power
Q5113	61-309429	PNP
Q5114	61-309430	NPN
Q5115	61-309412	PNP Power
Q5116	61-309412	PNP Power
R5101	51-82655	130, 5%
R5102	51-82423	820
R5103	51-82678	43,000, 5%
R5104	51-82458	680,000
R5105	51-82676	47,000, 5%
R5106	51-82429	2,700
R5107	51-82618	100, 5%
R5108	51-82457	560,000
R5109	51-82444	47,000
R5110	51-82439	18,000
R5111	51-82624	3,300, 5%
R5112	51-306319	50,000 Potentiometer

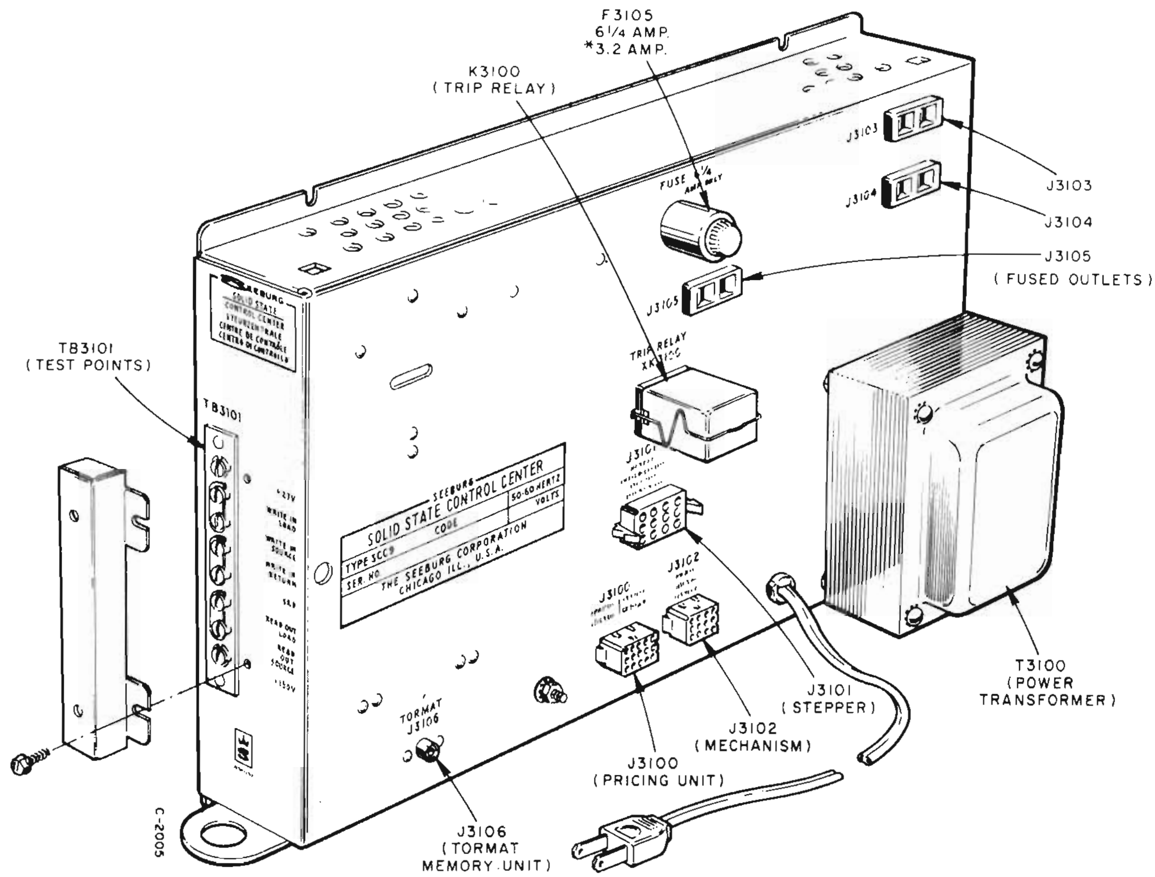
SOLID STATE STEREO AMPLIFIER, Types TSA9-56 & TSA9-H5

Item	Part No.	Description
R5113	51-82428	2,200
R5114	51-82410	68
R5115	51-82422	680
R5116	51-82424	1,000
R5117A	51-306318	25,000 Potentiometer
R5117B		25,000 Potentiometer
R5118	51-82631	7,500, 5%
R5119	51-82779	110,000, 5%
R5120	51-82627	4,700, 5%
R5121	51-306915	75 Potentiometer
R5122	51-82629	5,600, 5%
R5123	51-82421	560
R5124	51-82993	36, 5%
R5125	51-82433	5,600
R5126	51-82649	75, 5%
R5127	51-82406	33
R5128	51-81284	0.75, W.W., 5 W., 5%
R5129	51-81284	0.75, W.W., 5 W., 5%
R5131	51-82436	10,000
R5132	51-82452	220,000
R5133	51-82442	33,000
R5134	51-82442	33,000
R5135	51-82444	47,000
R5144	51-306319	50,000 Potentiometer
R5145	51-82428	2,200
R5146	51-82410	68
R5147	51-82422	680
R5148	51-82424	1,000
R5149	51-82649	75, 5%
R5150	51-82406	33
R5151	51-81284	0.75, W.W., 5 W., 5%
R5152	51-81284	0.75, W.W., 5 W., 5%
R5153	51-81243	168, W.W., 10 W.
R5154	51-81237	82, W.W., 2 W.
R5155	51-81201	250, W.W., 5 W.
R5156	51-81282	1,200, W.W., 2 W.
R5157	51-82441	27,000
R5158	51-82441	27,000
R5159	51-82155	27, 5%

Item	Part No.	Description
R5175	51-82424	1,000
R5176	51-82444	47,000
R5177	51-82459	820,000
R5178	51-82436	10,000
R5179	51-82444	47,000
R5180	51-82441	27,000
R5181	51-82682	62,000, 5%
R5182	51-82430	3,300
R5183	51-82434	6,800
R5184	51-82443	39,000
R5185	51-82448	100,000
S5102A	41-306329	Treble
S5102B		Treble
S5103A	41-306329	Bass
S5103B		Bass
S5104A	41-306329	Equalization
S5104B		Equalization
T5101	53-306840	Power Transformer
T5102	53-306991	Output Transformer
T5103	53-306991	Output Transformer
TB5101	73-306834	4 Lug Terminal Board
TB5103	73-306338	4 Lug Terminal Board
TB5104	73-306834	4 Lug Terminal Board
TB5105	73-307650	2 Lug Terminal Board
W5101	70-766369	Line Cord & Plug Assem.
Z5102	44-306914	Mute Trip Relay Assem.

NOTE:
1. Unless otherwise specified all resistors are in ohms, ½ watt and 10%.
2. Unless otherwise specified all capacitors are in microfarads.
3. For H5 units, use alternate components marked with a double asterisk (**).

SOLID STATE CONTROL CENTER, Type SCC9



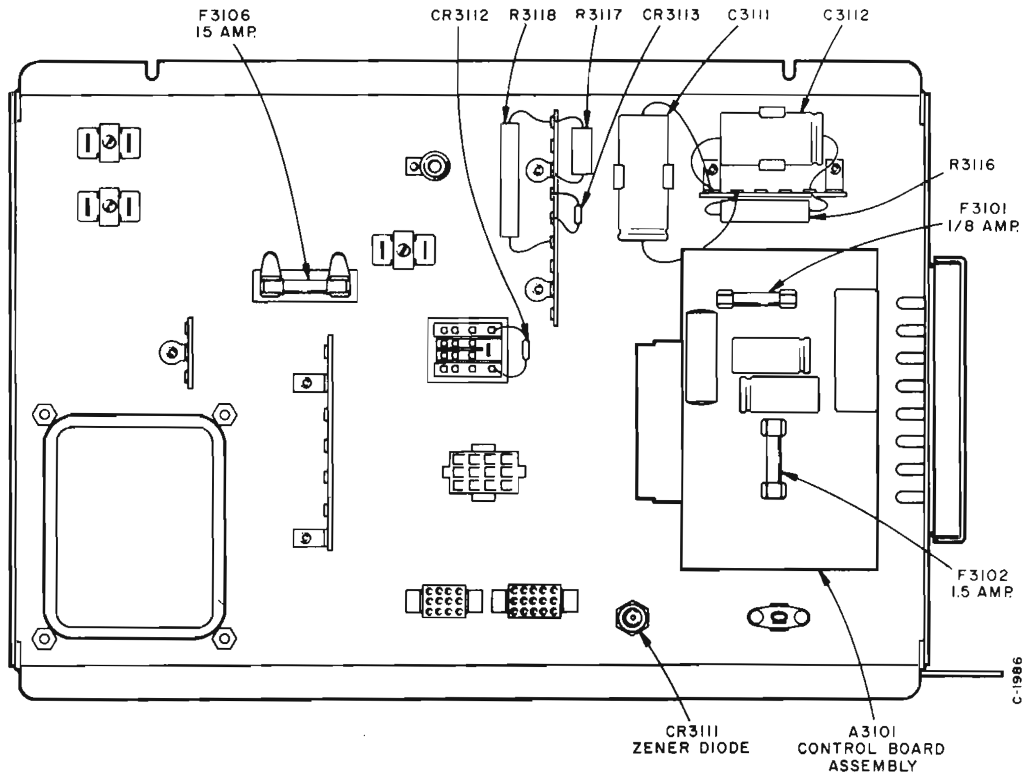
The Solid State Control Center is a power distribution center and a junction for control circuits of the Select-O-Matic phonograph. The control center includes a Power Supply as well as Write-In, Read-Out and Sensing Circuits.

Power is supplied to the unit through a line cord and is distributed to the electrical circuits of the phonograph. The Power Transformer is designed so that by interchanging its primary connections, the unit may be operated from either 120 VAC or 235 VAC. The power supply provides a fused voltage source of +40 V. DC., +395 V. DC and 24 V. AC. for the various circuits in the phonograph. The unit provides the Write-In and Read-Out source for use in the selection system of the phonograph, while the Sensing Circuit, when activated by an output pulse from the Memory Unit, will initiate the tripping action needed to stop the carriage at the selected record.

All connections between the SCC9 and other units within the phonograph cabinet are made with plugs that are keyed by color and/or shape or number of contacts so they cannot be incorrectly connected. Test points are incorporated on the front of the chassis to facilitate trouble-shooting.

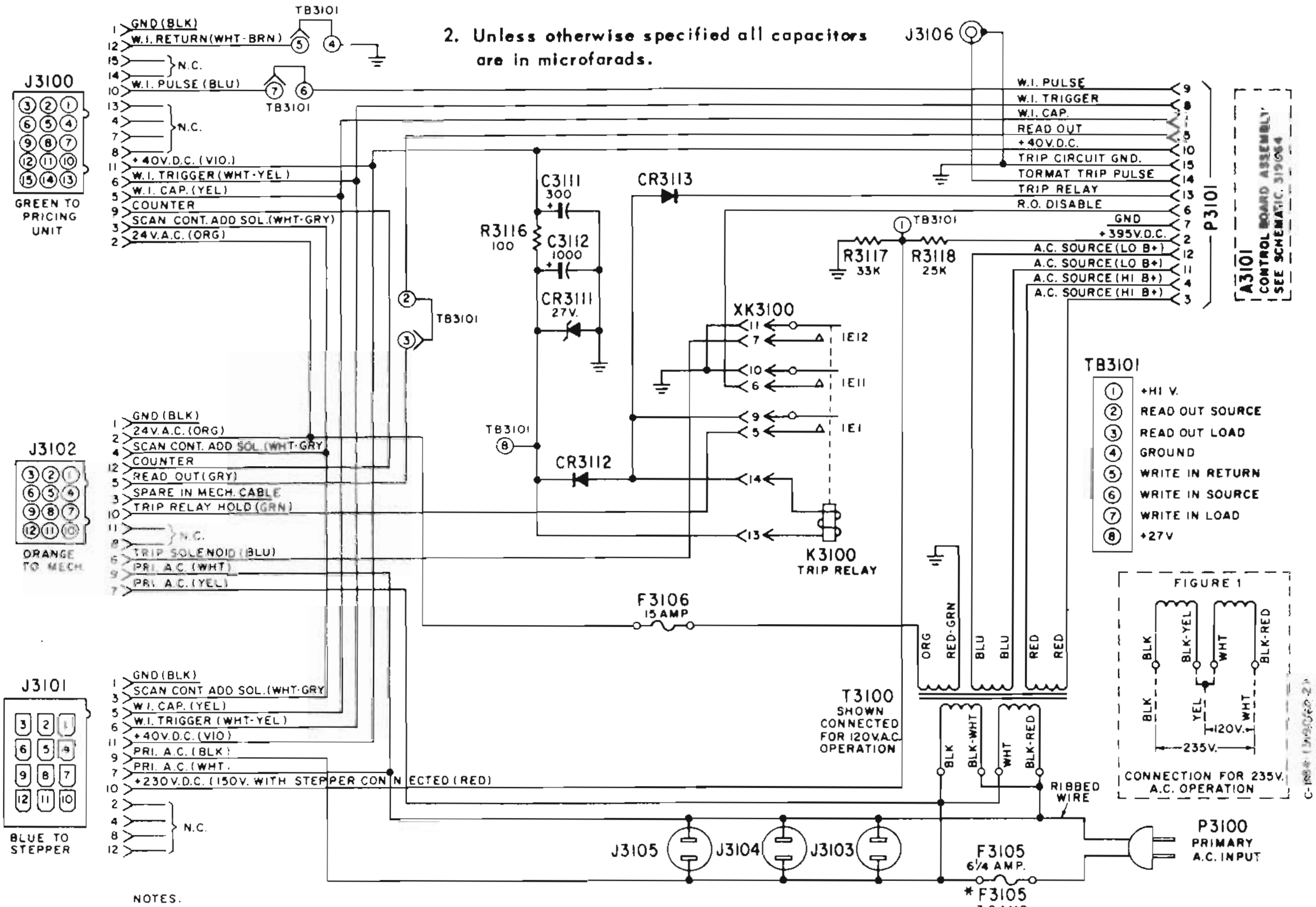
A Solid State Stepper Unit, Type SSU4, may be used with the Solid State Control Center whenever remote control operation is desired. All interconnections are made with one (12 pin) plug.

SOLID STATE CONTROL CENTER, Type SCC9



NOTE: 1. Unless otherwise specified all resistors are in ohms, ½ watt and 10%.

2. Unless otherwise specified all capacitors are in microfarads.

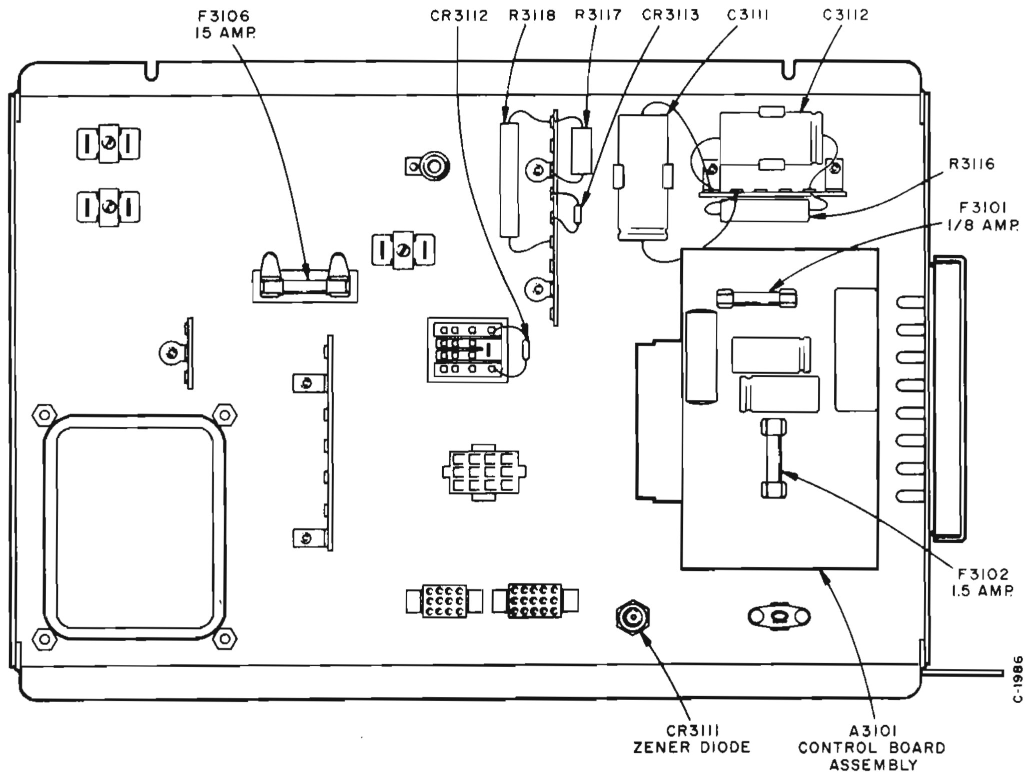


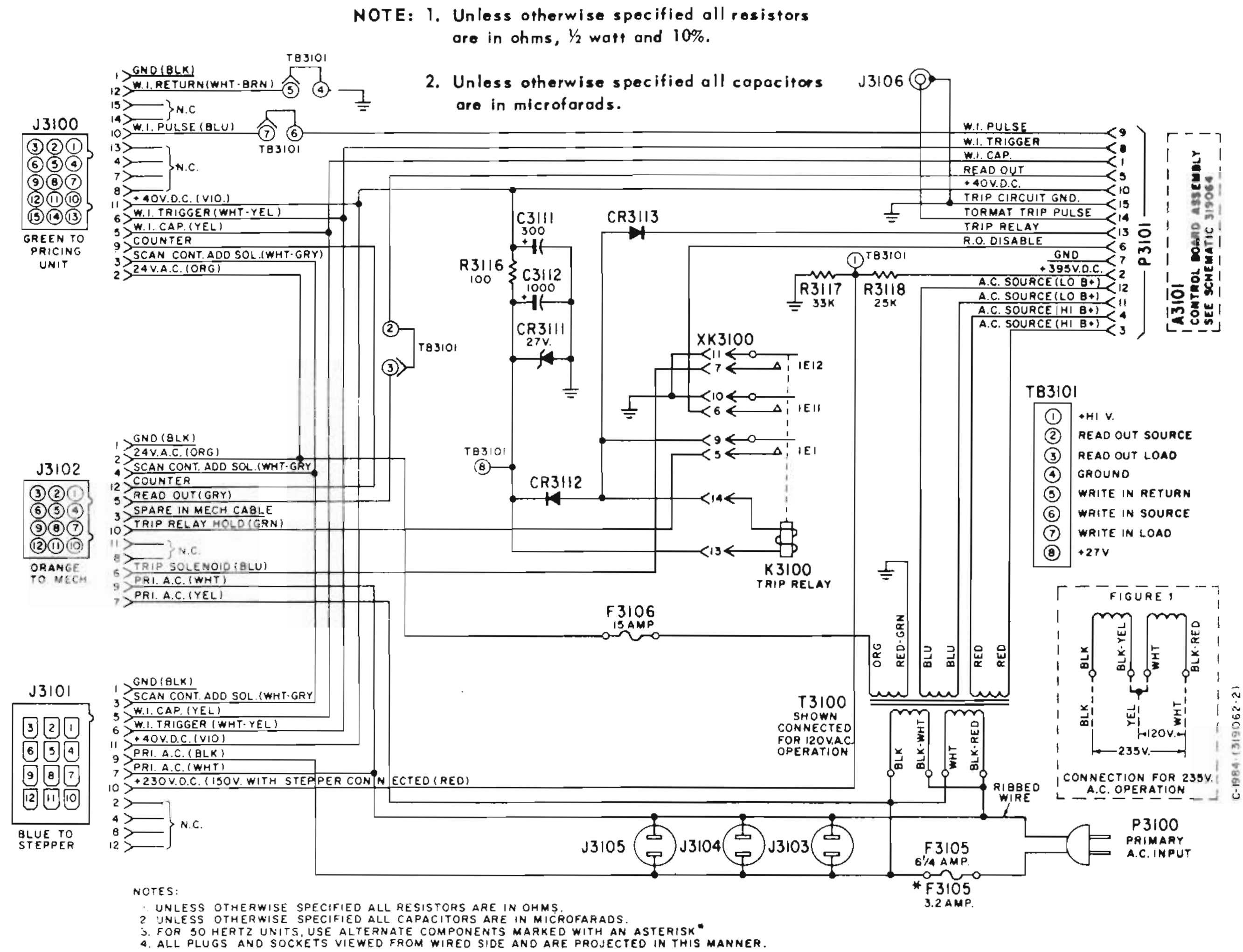
NOTES.
1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE IN OHMS.
2. UNLESS OTHERWISE SPECIFIED ALL CAPACITORS ARE IN MICROFARADS.
3. FOR 50 HERTZ UNITS, USE ALTERNATE COMPONENTS MARKED WITH AN ASTERISK*
4. ALL PLUGS AND SOCKETS VIEWED FROM WIRED SIDE AND ARE PROJECTED IN THIS MANNER.

Item	Part No.	Description
A3101	70-319021	Control Board Assembly
C3111	52-87611	300, 50 V., Lytic
C3112	52-87725	1000, 35 V., Lytic
CR3111	62-309375	Zener Diode, 10 W., 27V.
CR3112	62-309384	Silicon Diode, 170 PIV
CR3113	62-309481	Silicon Diode, 40 PIV
F3105	45-307830	6-1/4 Amp. Fuse
* F3105	45-303713	3.2 Amp. Fuse
F3106	45-307556	15 Amp. Fuse
J3100	73-309590	15 Cont. Skt Hsg. (GRN)
J3101	73-309361	12 Cont. Skt Hsg. (BLU)
J3102	73-309576	12 Cont. Skt Hsg. (ORG)
J3103	73-770235	A.C. Receptacle
J3104	73-770235	A.C. Receptacle
J3105	73-770235	A.C. Receptacle
J3106	73-303446	Single Prong Phono Skt
K3100	44-509802	Relay
P3100	70-306351	Line Cord
P3101	73-318101	15 Pos. Edge Connector
R3116	51-81173	100, 7 W.
R3117	51-82874	33,000, 2 W.
R3118	51-82881	25,000, 5 W.
T3100	53-317840	Power Transformer
TB3101	73-317017	8 Lug Terminal Board
XK3100	73-509803	Relay Socket

For 50 Hz. units, use alternate components marked with an asterisk (*).

SOLID STATE CONTROL CENTER, Type SCC9

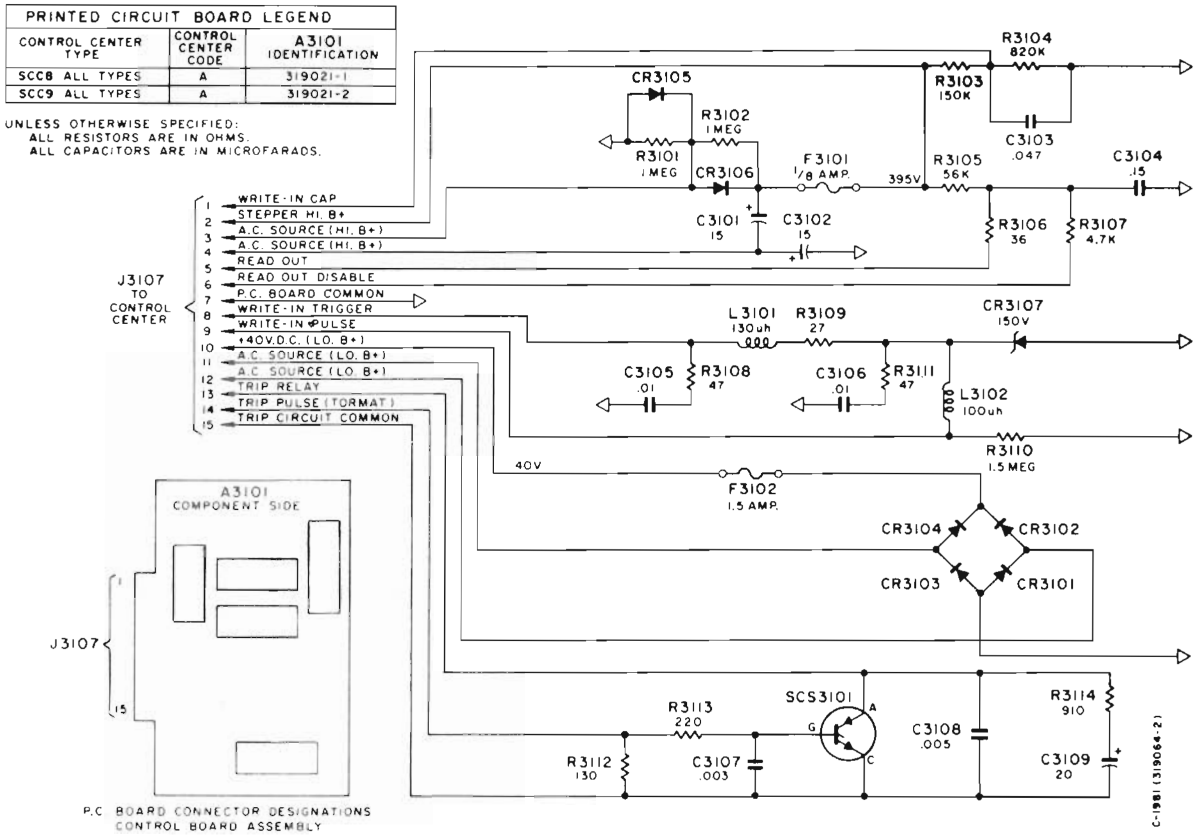




Item	Part No.	Description
A3101	70-319021	Control Board Assembly
C3111	52-87611	300, 50 V., Lytic
C3112	52-87725	1000, 35 V., Lytic
CR3111	62-309375	Zener Diode, 10 W., 27V.
CR3112	62-309384	Silicon Diode, 170 PIV
CR3113	62-309481	Silicon Diode, 40 PIV
F3105	45-307830	6-1/4 Amp. Fuse
* F3105	45-303713	3.2 Amp. Fuse
F3106	45-307556	15 Amp. Fuse
J3100	73-309590	15 Cont. Skt Hsg. (GRN)
J3101	73-309361	12 Cont. Skt Hsg. (BLU)
J3102	73-309576	12 Cont. Skt Hsg. (ORG)
J3103	73-770235	A.C. Receptacle
J3104	73-770235	A.C. Receptacle
J3105	73-770235	A.C. Receptacle
J3106	73-303446	Single Prong Phono Skt
K3100	44-509802	Relay
P3100	70-306351	Line Cord
P3101	73-318101	15 Pos. Edge Connector
R3116	51-81173	100, 7 W.
R3117	51-82874	33,000, 2 W.
R3118	51-82881	25,000, 5 W.
T3100	53-317840	Power Transformer
TB3101	73-317017	8 Lug Terminal Board
XK3100	73-509803	Relay Socket

For 50 Hz. units, use alternate components marked with an asterisk (*).

70-319021 CONTROL BOARD ASSEMBLY



Item	Part No.	Description
A3101	70-319021	Control Board Assembly
C3101	52-87749	15, 250 V., Lytic
C3102	52-87749	15, 250 V., Lytic
C3103	52-86290	.047, 600 V., Mylar
C3104	52-86296	.15, 600 V., Mylar
C3105	52-86313	.01, 500 V., Ceramic
C3106	52-86313	.01, 500 V., Ceramic
C3107	52-86278	.003, 500 V., Ceramic
C3108	52-86250	.005, 500 V., Ceramic
C3109	52-87660	20, 35 V., Lytic
CR3101	62-309476	Silicon Diode, 100 PIV
CR3102	62-309476	Silicon Diode, 100 PIV
CR3103	62-309476	Silicon Diode, 100 PIV
CR3104	62-309476	Silicon Diode, 100 PIV
CR3105	62-309372	Silicon Diode, 600 PIV
CR3106	62-309372	Silicon Diode, 600 PIV
CR3107	62-309485	Zener Diode, 500 MW, 150 V.
F3101	45-319028	1/8 Amp. Fuse
F3102	45-764814	1-1/2 Amp. Fuse

Item	Part No.	Description
L3101	53-303603	130 Microhenry Inductor
L3102	53-303702	100 Microhenry Inductor
R3101	51-82460	1,000,000
R3102	51-82460	1,000,000
R3103	51-82880	150,000, 1 W.
R3104	51-82459	820,000
R3105	51-82883	56,000, 4 W.
R3106	51-82993	36, 5%
R3107	51-82432	4,700
R3108	51-82617	47, 5%
R3109	51-82155	27, 5%
R3110	51-82462	1,500,000
R3111	51-82617	47, 5%
R3112	51-82655	130, 5%
R3113	51-82658	220, 5%
R3114	51-82661	910, 5%
SCS3101	61-309472	Silicon Control Switch

TORMAT ELECTRICAL SELECTOR, Type TES112-56

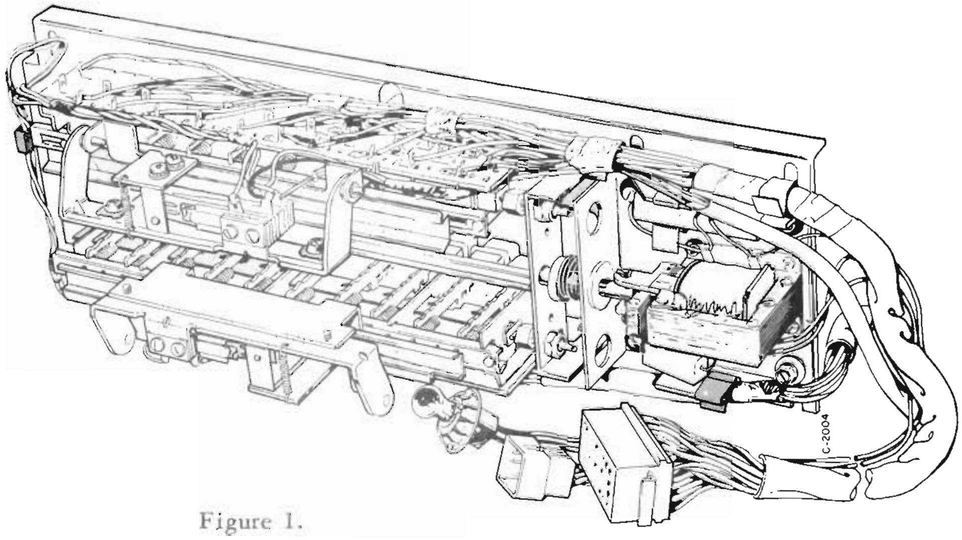


Figure 1.

1. GENERAL

The Tormat Electrical Selector, Type TES112-56, is part of the Seeburg Tormat Selection System. The principal functions of the selector are to connect a letter and a number circuit of the Tormat Memory Unit of the system into a selection write-in circuit and to complete a circuit that initiates the operational sequence of the system. These are performed by operating a lettered key and a numbered key.

The principal component parts of the selector include the two selection switch assemblies, a latch bar operating solenoid, credit indicating light, a credit lamp terminal strip and two switch groups, each of which has two pairs of contacts.

The credit indicating light is extended on its connecting leads so it illuminates the selection information window that is in the phonograph.

The latch bar function is to hold in a selection switch (and selector key) when a selection is being made and to release it when the selection is complete. The solenoid is energized when credits are set up in the phonograph.

The shafts of the selector switches operate treadle bars when a selector key is pressed and the treadle bars, in turn, operate switch groups consisting of a spring-leaf switch and a snap-action, over-center switch. One switch group is associated with each of the selection switches. The spring-leaf switches are connected in parallel and are part of a Credit Timing Relay Carry-Over Circuit. This prevents accidental multiple selection of the same record if the selection keys are held down too long. These switches are the Timing Relay Carry-Over Switches,including contacts 1S2 and 2S2.

The snap-action switches are the Start Switches, contacts 1S1 and 2S1. The 1S1 contacts close when a letter selector key is pressed. The 2S1 contacts are closed by pressing a number selector key and are in series with the 1S1 contacts. These contacts are part of a circuit that includes a Subt. Solenoid in the phonograph Pricing Unit. When a letter key and a number key are pressed, the start switches complete the circuit to the Subtract Solenoid

2. REMOVAL OF ELECTRICAL SELECTOR

The Electrical Selector Assembly may be removed by first opening the cabinet lid to the fully raised position. Disconnect its connector and remove the credit lamp socket out of its mounting. Remove the six screws and remove Selector.

3. LUBRICATION

Oil all pivots with one drop of Seeburg No. 53025 Select-O-Matic Special Purpose Oil. Use Aero Lubriplate sparingly on the surfaces of the latch levers where they bear on the solenoid plunger and the latch bars. (See your Seeburg distributor for oil and lubriplate.)

4. NUMBER AND LETTER TREADLE BAR SPRINGS

To move the number or letter treadle bars from their normal rest position should require a force of 4½ to 5½ ounces. If the force required to move a bar is more than 5½ ounces, check for binds at the pivot points. If the force required to

move a bar is less than 4½ ounces, replace the associated spring.

5. LATCH RELEASE LEVER SPRING

Refer to Figure 2. Restrain the movement of the number release lever. The force required to start movement of the solenoid armature should be 5 to 7 ounces. If the force required to move the armature is more than 7 ounces, check for binds in the solenoid. If the force required to move the armature is less than 5 ounces, replace the spring.

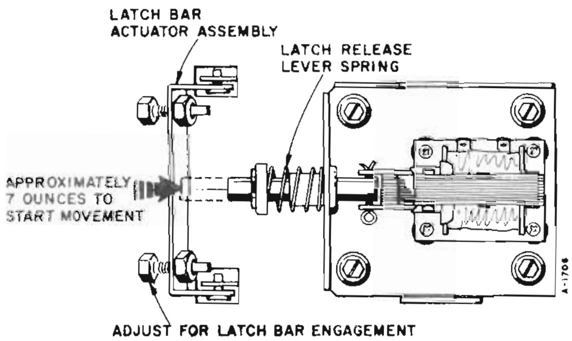


Figure 2.
Latch Release Lever Spring Detail.

6. LATCH BAR SPRING

Refer to Figure 3. The force required to start movement of the latch bar should be 6 to 7 ounces. If more than 7 ounces of force is required, check for binds in the switch assembly. If less than 6 ounces of force is required, replace the spring.

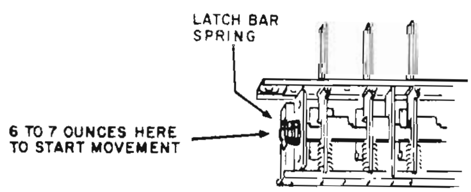


Figure 3. Latch Bar Spring Detail.

7. NUMBER SWITCH

This adjustment positions the latch bar in the number selector switch so that when credits are established, the selector switches will latch in the pressed-in position but permit change of selection by operating another switch in the number group.

NOTE:
When making this adjustment the latch bar solenoid must be in the energized position, all linkage and bars must be free to move without binding and there should be a gap between the latch release lever and the end of the latch bar solenoid plunger rod.

Refer to Figure 4. Loosen the latch lever adjusting screw holding the latch release lever bracket and position the bracket so the tips of the latch bar hooks extend 1/64 inch through the openings in the selector switch shafts. If the bracket is too far to the right, the selector keys will be locked out. If the bracket is too far to the left, the selector keys will not latch or the latching will be erratic. After the bracket has been correctly positioned, securely tighten the bracket holding screw.

8. LETTER SWITCH

This adjustment positions the latch bar of the letter switch so these lettered selector switches will operate in the same manner provided for the number switch in the preceding paragraph. The adjusting screw is accessible through a hole in the bottom of the selector frame.

NOTE:
Before making this adjustment, the following conditions must be met:

a. The number switch adjustment must be correct.

b. The latch bar solenoid must be in the energized position.

c. All linkage and bars must be free to move without binding.

d. There should be a gap between the release lever and the end of the latch bar solenoid plunger rod.

Refer to Figure 4. Loosen the adjusting screw in the latch bar link between the letter and the number switches and position the letter switch latch bar so the tips of the latch bar hooks extend 1/64 inch through the openings in the selector switch shafts. Securely tighten the adjusting screw. Check this adjustment by pressing a letter and number switch, while manually

TORMAT ELECTRICAL SELECTOR, Type TES112-56

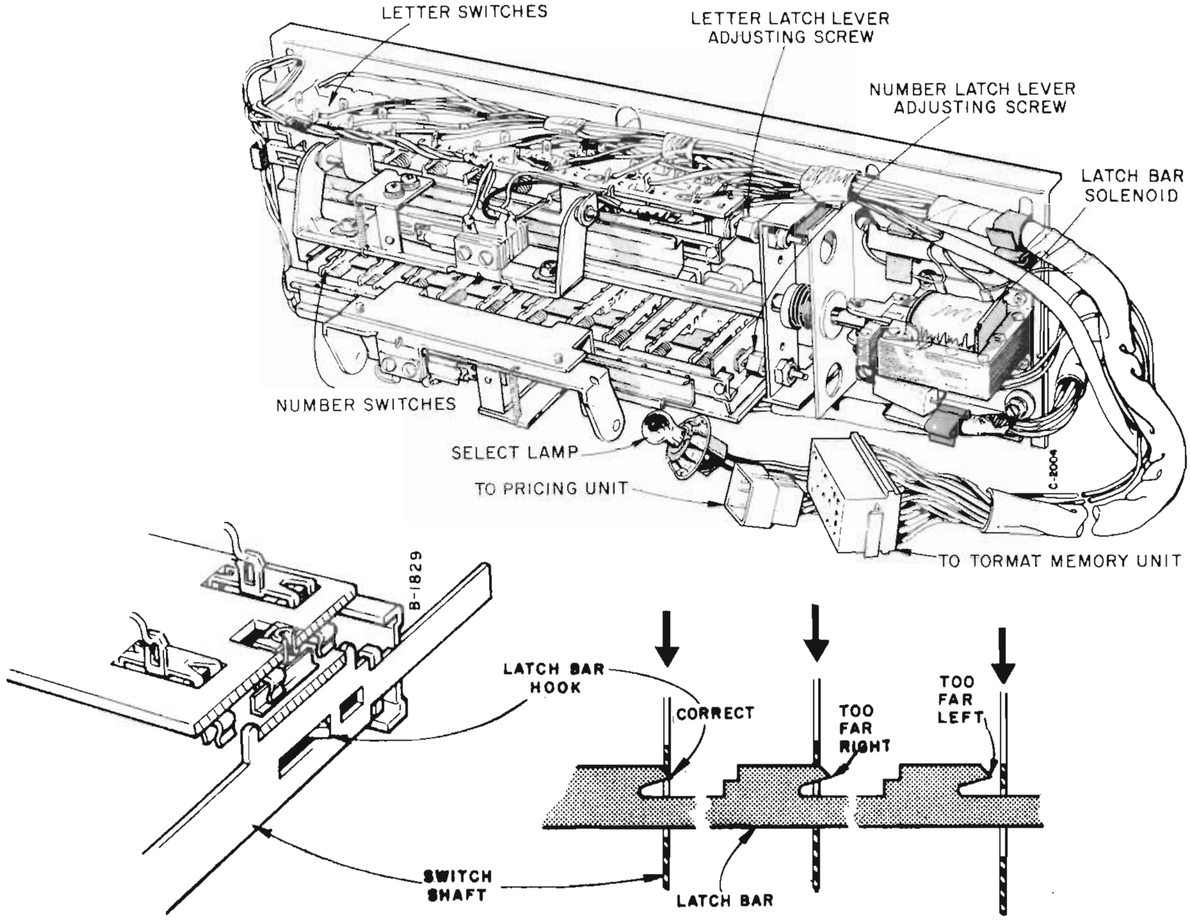


Figure 4. Number and Letter Switch Adjustment Detail.

holding the latch bar solenoid in the energized position, then slowly release the solenoid. Both switches should release at the same time.

9. TREADLE BAR

NOTE:
All treadle bars should move freely on their pivots to rest against the rubber bumpers and should have a small amount of end play.

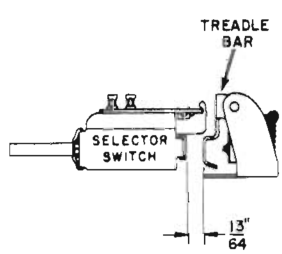


Figure 5. Treadle Bar Adjustment Detail.

Refer to Figure 5. With the treadle bar against the rubber bumper in the treadle bar adjusting plate, position the plate after loosening the the treadle bar bracket screws so there is 13/64 inch (0.203 inch) separation between the treadle bar and the frame of the selector switch. Use the shank of a No. 6 (0.204 inch) or No. 7 (0.201 inch) or a 13/64 inch twist drill for a spacing gauge.

10. START AND CARRY-OVER SWITCHES

The timing of the snap action start switches is adjusted by positioning the brackets for the entire switch assembly. DO NOT ADJUST BY BENDING THE SNAP ACTION SWITCH BLADES.

Refer to Figure 6. Loosen the bracket holding screws and position the switches so the start switch contacts close when the selector switches have approximately 1/32 inch more travel before latching by the latch bars.

TORMAT ELECTRICAL SELECTOR, Type TES112-56

Adjust the Carry-Over Switch AFTER the Start Switch has been correctly set. With all selector switches released and the treadle bar resting against the rubber pad, the contacts on the Carry-Over Switches should be CLOSED with 20 grams minimum force.

With Selector Switches latched in, contacts on Carry-Over Switches must be open with 0.015 inch minimum gap.

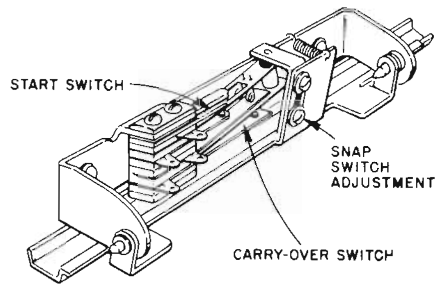
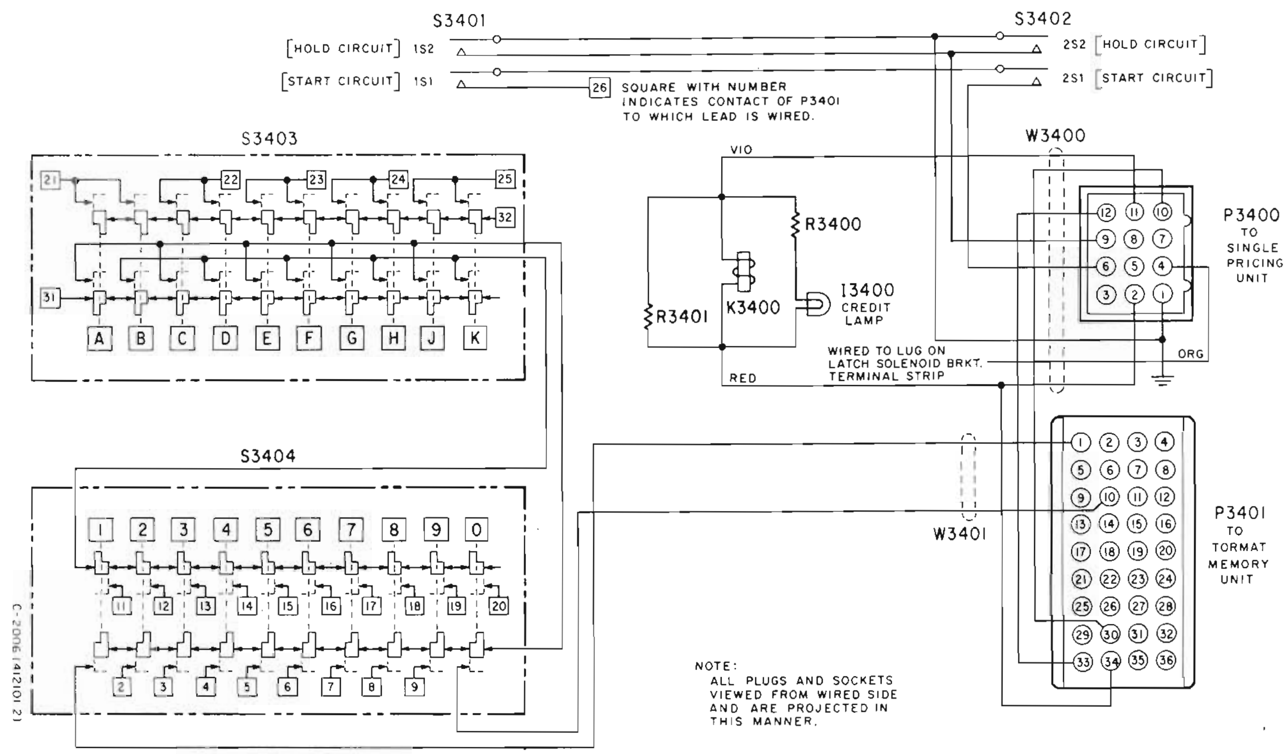


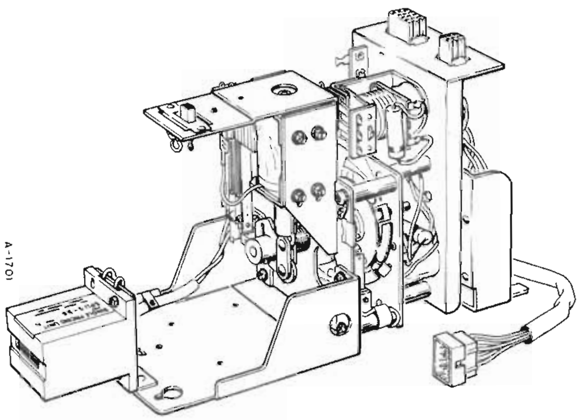
Figure 6. Start Switch Adjustment.



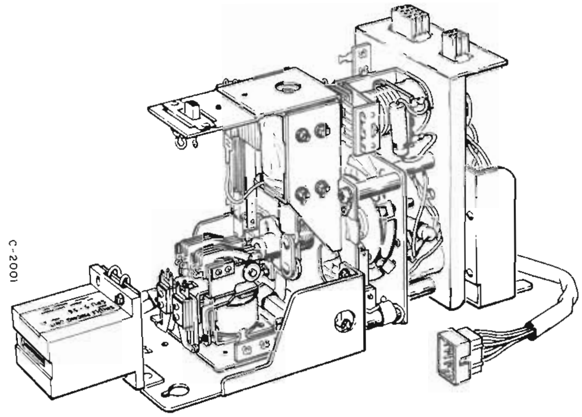
Item	Part No.	Description
I3400	55-507522	Lamp
K3400	44-411823	Latch Solenoid Assembly
P3400	73-309580	12 Cont. Pin Hsg. (WHT)
P3401	73-309315	36 Cont. Skt Hsg. (WHT)
R3400	51-81232	180, 5 W.
R3401	51-81183	100, 10 W.

Item	Part No.	Description
S3401	40-411140	Treadle Pivot & Sw.Assem.
S3402	40-411140	Treadle Pivot & Sw.Assem.
S3403	10-412081	Letter Sw. Swaged Assem.
S3404	10-412085	Number Sw. Swaged Assem.
W3400	70-412099	Control Cable Assembly
W3401	70-412098	Matrix Cable Assembly

SINGLE PRICING UNIT, Type SPU5



SINGLE PRICING UNIT, SPU5-56



SINGLE PRICING UNIT, SPU5-X & SPU5-Y

The Single Pricing Unit, Type SPU5, is a part of the Tormat Selection System. Its function is to store credit for the coins deposited, light the credit lamp, cancel the credit as it is used, control the selection system write-in pulse and operate the Play Control Assembly.

Operating voltages are taken from the Solid State Control Center (SCC9) to which it is connected by a cable and plug.

The principle parts of the unit are three credit solenoids, a cancel solenoid, two cam operated switch groups and a timing relay.

The credit switch is a "wheel" supporting six equally spaced snap-action switches which are parallel connected and terminate at a collector ring and the grounded frame of the unit. The snap-action switches are closed by the plungers of the credit solenoids. Closing any of them establishes "credit" so selections can be made. Each time a selection is made, the cancel solenoid in the unit advances the credit switch one sixth turn. It is advanced, therefore, one position - the distance between the snap-action switches - for each selection made.

A reset bracket is so mounted on the assembly that a snap-action switch moves past it each time a selection is made. When a snap-action switch that has been turned "on" (by a credit solenoid plunger) passes the bracket, it is engaged by the bracket and reset to the "off" position.

In order to provide pricing information that would apply to all coins, the three credit solenoids will be referred to as "1st coin, 2nd coin, and 3rd coin" credit solenoids. The 1st coin is considered the coin with the lowest monetary value, the 2nd coin is considered the coin with the middle monetary value and the 3rd coin is considered the coin with the highest monetary value.

The cancel solenoid is linked to one of the switch cams so the cam is rotated approximately 60 degrees when the solenoid is energized. This cam is pinned to a shaft which drives the other of the two switch cams. A pawl on the second cam engages a ratchet on the credit switch and moves it one position each time the solenoid plunger operates.

The timing relay operates at approximately 25 volts d.c. and is loaded with copper slugs that delay starting of its armature from the rest position. The delay is introduced to control the time the contacts in the switch groups are closed.

MECHANICAL ADJUSTMENTS

1. The Pawl Arm Stop limits the rotation of the credit switch when the Cancel Solenoid plunger returns to normal rest position. It should be adjusted so the credit switch rotates far enough to allow the Lock Pawl to fall into the ratchet and have approximately 1/64" overtravel. The adjustment must be checked at all six positions of the credit wheel and the ratchet. After adjustment, set the lock nut tight. See figure 3.

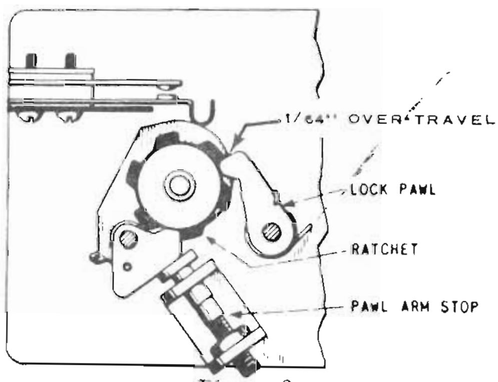


Figure 3.

2. Adjust the position of the Cancel Solenoid Stop Bracket so the Cancel Pawl overtravels the ratchet teeth approximately 1/32" when the solenoid plunger bottoms against the Stop. Set the Stop mounting screws firmly after adjustment. See figure 4.

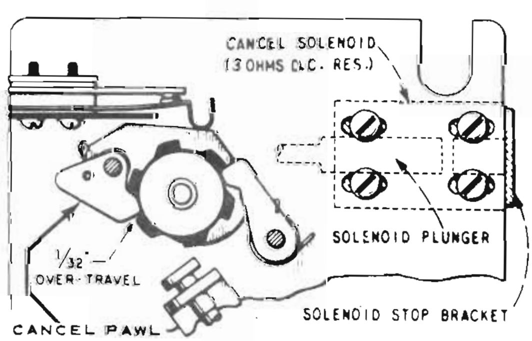


Figure 4.

3. Set the end of the Cam Spring in the first hole in the panel. Check operation by closing all snap-action credit switches and allow the Cam Spring to rotate the switches past reset bracket. This should be checked slowly to determine if the Spring pressure is adequate to reset the switches without benefit of inertia. If more spring pressure is required, move to the second hole and repeat the test. Use the lowest spring pressure (consistent with positive operation) to insure minimum wear and optimum low voltage operation.

4. The pressure of the credit wheel contact blade against the ring on the credit switch should be approximately 2 1/2 oz. Excessive pressure will result in excessive wear and sluggish rotary action of the credit switch.

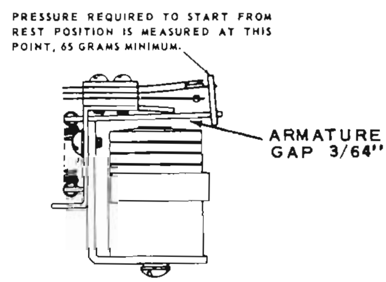
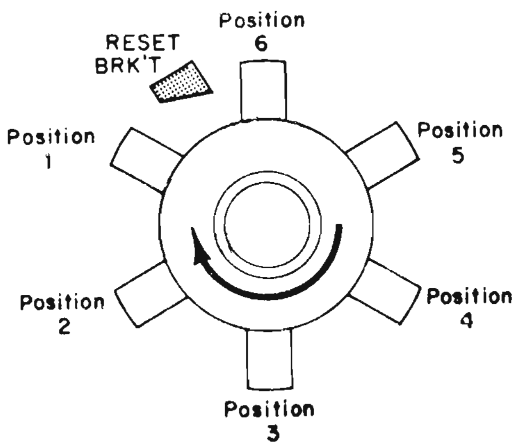


Figure 5.

SWITCH	CONTACT	PRESSURE	CONTACT GAP	NORMAL POSITION
CAM SWITCH	3P1	100 Gm. min.	.020" .5MM	OPEN
	4P1	30 Gm.	.040" – 1MM ON INSULATOR	OPEN
	3P2	35 Gm.	.020" .5MM	OPEN
TIMING RELAY	1P2	30 – 45 Gm.	.030" .8MM	CLOSED
	1P1	30 – 45 Gm.	.030" .8MM	OPEN
S4100 SWITCH	2P1	30 Gm.	.020" .5MM	OPEN
CAM SWITCHES (ON RELAY) GAP .016" .4MM			CONTACT PRESSURE 15 Gm.	
TAIL SWITCH N.O. GAP .030" .8MM; N.C. Contact when open .008" .2MM			CONTACT PRESSURE 25 Gm.	

The basic SPU5 Pricing Unit provides a range of from one(1) credit to six(6) credits. This is accomplished by positioning three(3) Credit Solenoids under a six(6) position Credit Wheel.



A typical pricing combination would be:

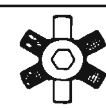
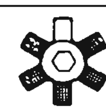
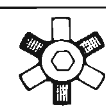
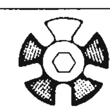
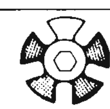
1st Coin Credit Solenoid (Green Wire) under position 1 for 1 selection.
2nd Coin Credit Solenoid (Yellow Wire) under position 3 for 3 selections.
3rd Coin Credit Solenoid (Red Wire) under position 6 for 6 selections.

To provide more than 6 selections per coin (highest value coin) it would be necessary to add a Sequence Relay. There are two types of Sequence Relays used in the SPU5 Code F Pricing Unit.

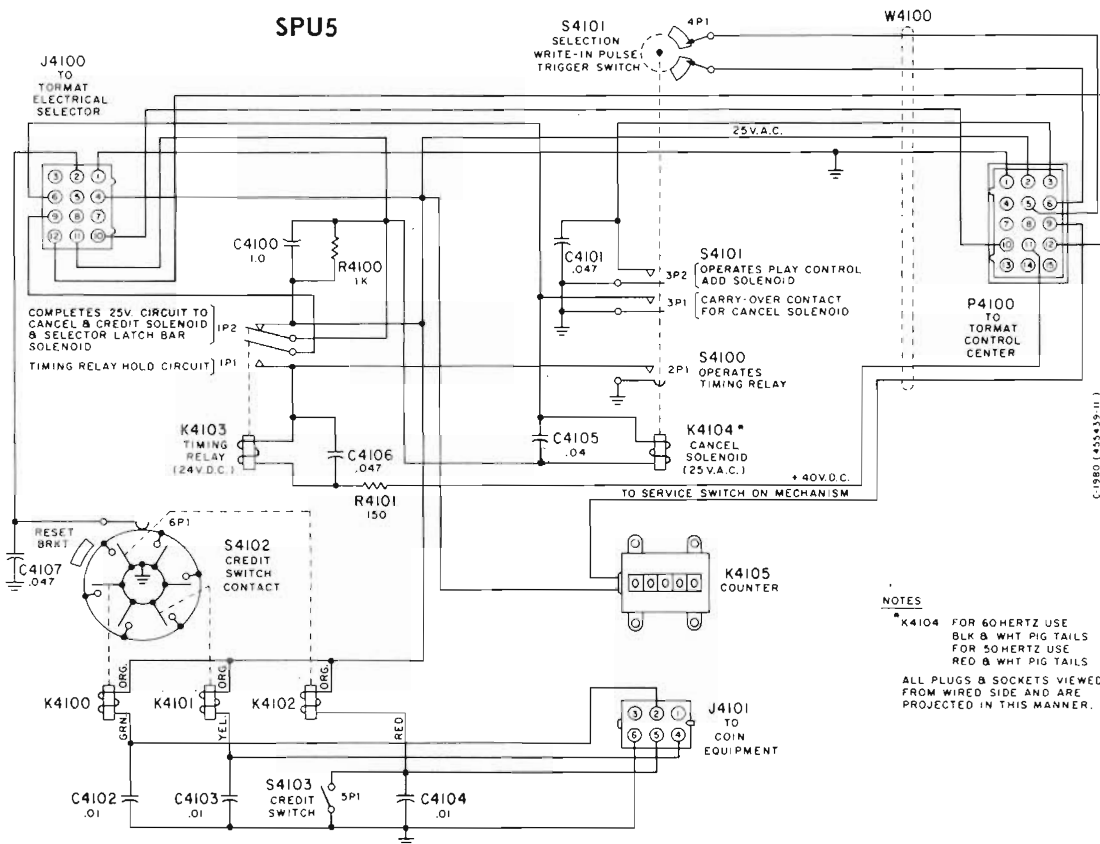
Part No.	Description
44-455519	12 Step Sequence Relay (4 cams - 6 lobes per cam.)
44-455520	10 Step Sequence Relay (4 cams - 5 lobes per cam.)

As shown in the Schematic of the SPU5X, (Schematic is shown on Page 19) the "7PI" cam switch is normally connected to the 3rd Coin Credit Solenoid (Red Wire). For various pricing combinations various lobes must be cut off of the active cam or cams.

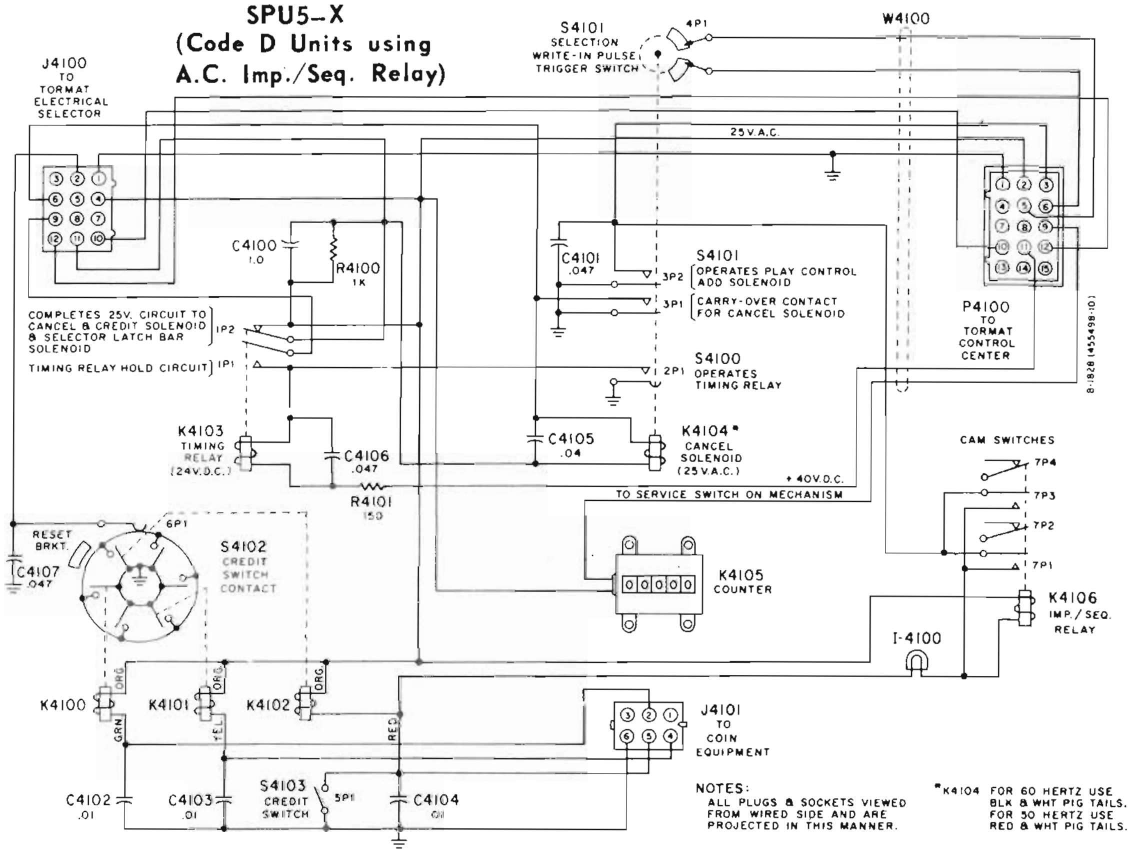
The 1st and 2nd Credit Solenoids should be placed in their appropriate credit position under the Credit Wheel. The following chart shows how the Pricing Unit should be set so the 3rd Coin Credit Solenoid can add the desired credit.

Pricing Combination	Sequence Relay To Use	Lobe Shape (Shaded Lobes Should Be Cut Off)	Position Of 3rd Coin Credit Solenoid (Red Wire) Under Credit Wheel
1st Coin- 1 Selection 2nd Coin- 3 Selections 3rd Coin- 7 Selections	12 Step (44-455519)		Position 5
1st Coin- 1 Selection 2nd Coin- 4 Selections 3rd Coin- 9 Selections	12 Step (44-455519)		Position 5
1st Coin- 1 Selection 2nd Coin- 2 Selections 3rd Coin-15 Selections	12 Step (44-455519)		Position 5
1st Coin- Not Used 2nd Coin- 2 Selections 3rd Coin- 8 Selections	12 Step (44-455519)		Position 6
1st Coin- 2 Selections 2nd Coin- 5 Selections 3rd Coin-11 Selections	10 Step (44-455520)		Position 3
1st Coin- 2 Selections 2nd Coin- 5 Selections 3rd Coin-12 Selections	10 Step (44-455520)		Position 4

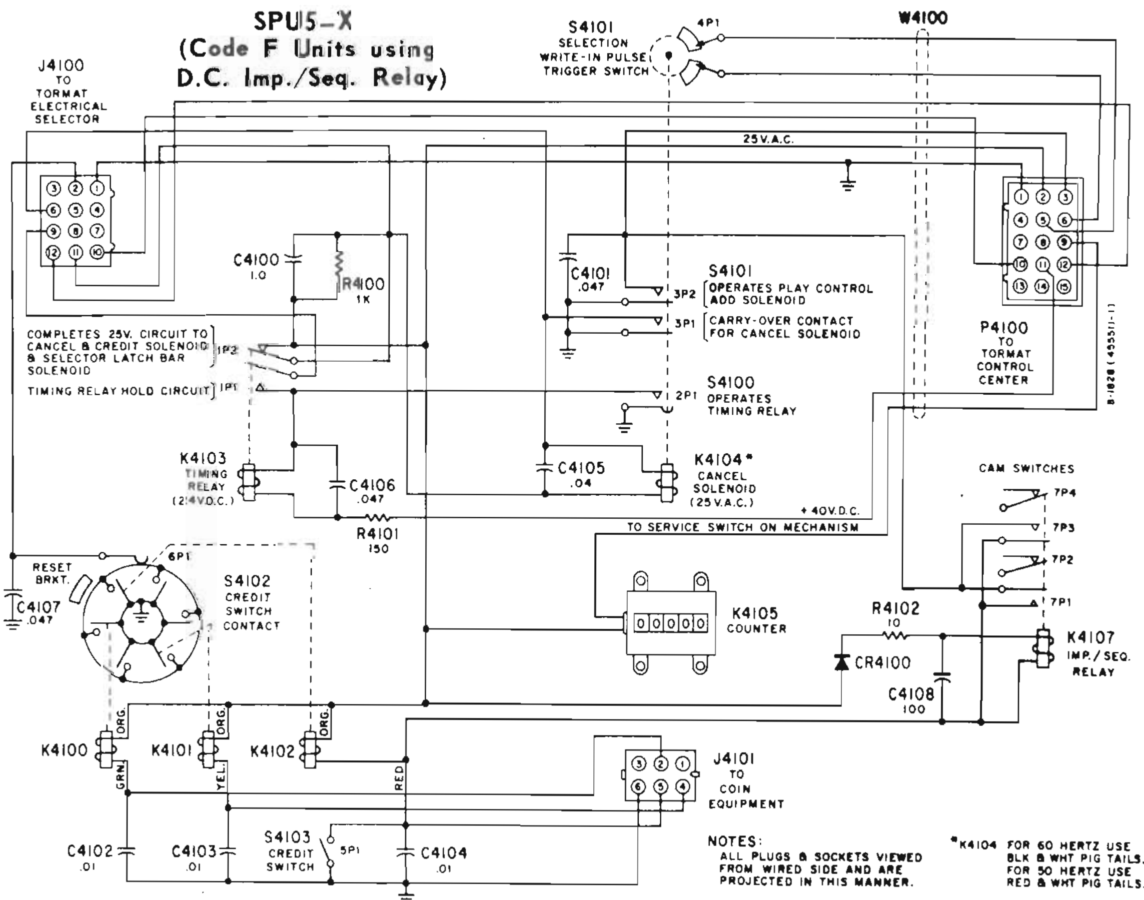
If two (2) selections for a quarter and five (5) selections for a half dollar or two (2) quarters pricing is desired, a 10 or 12 step sequence relay must be used, (see schematic for SPU5Y code D & F on Page 21). The first quarter deposited energizes the credit solenoid in position 2 and the sequence relay. After the sequence relay denergizes, the contacts on the relay parallel the credit solenoids in positions 2 and 5. The second quarter deposited now energizes both credit solenoids, providing a selection was not made after the first quarter was deposited. If a selection is made after the first quarter is deposited, the "3P2" will energize the sequence relay, resetting the bonus credit. It should be noted that lobes <u>are not</u> removed from any of the cams on the sequence relay.



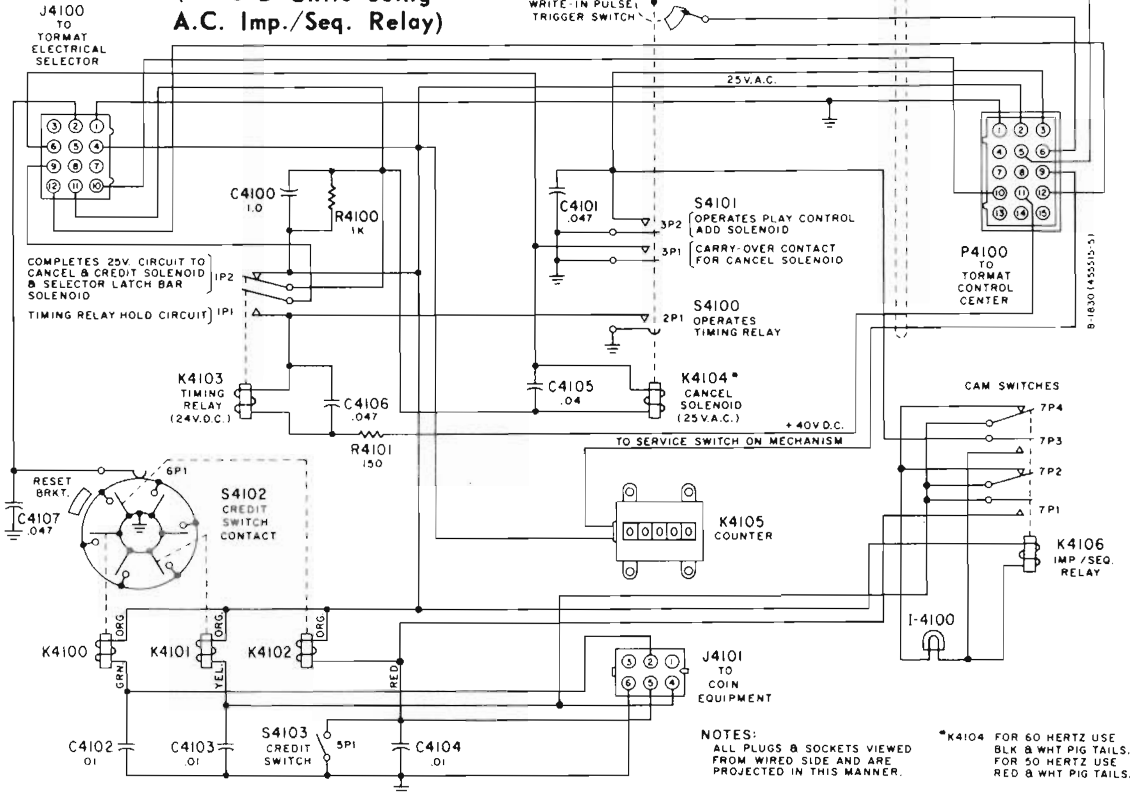
SPU5-X (Code D Units using A.C. Imp./Seq. Relay)



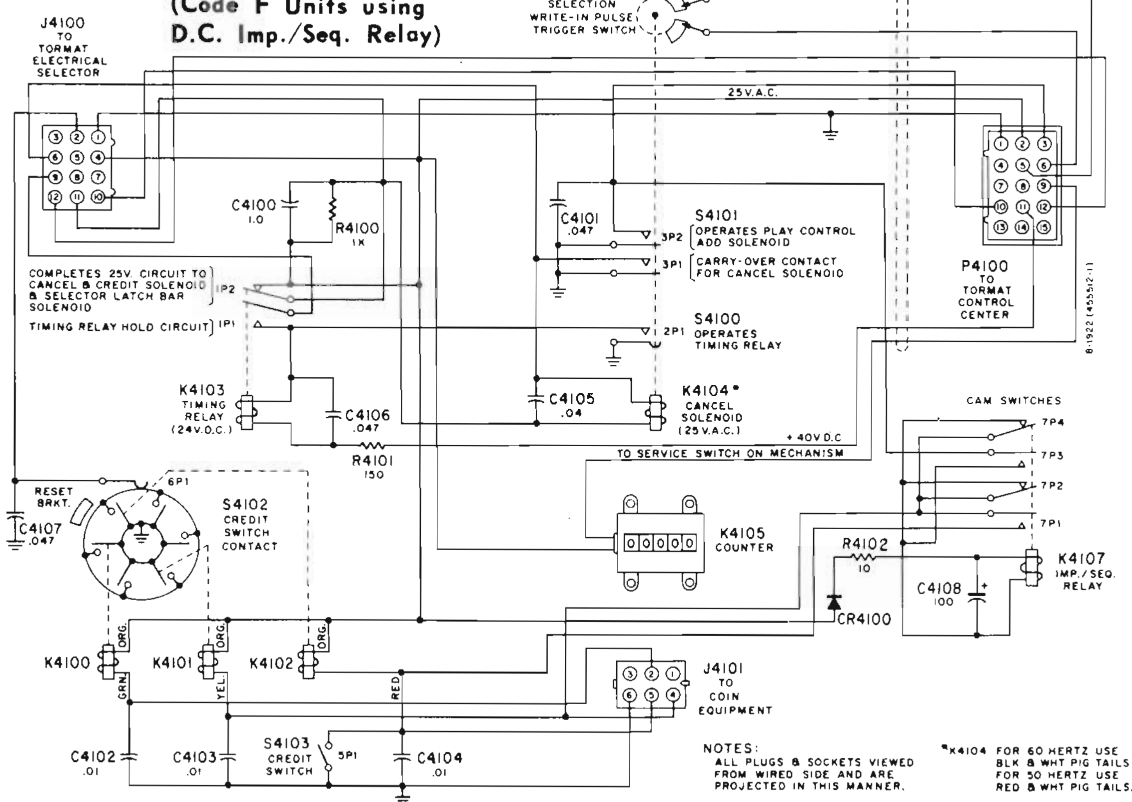
SPU5-X (Code F Units using D.C. Imp./Seq. Relay)



SPU5–Y (Code D Units using A.C. Imp./Seq. Relay)

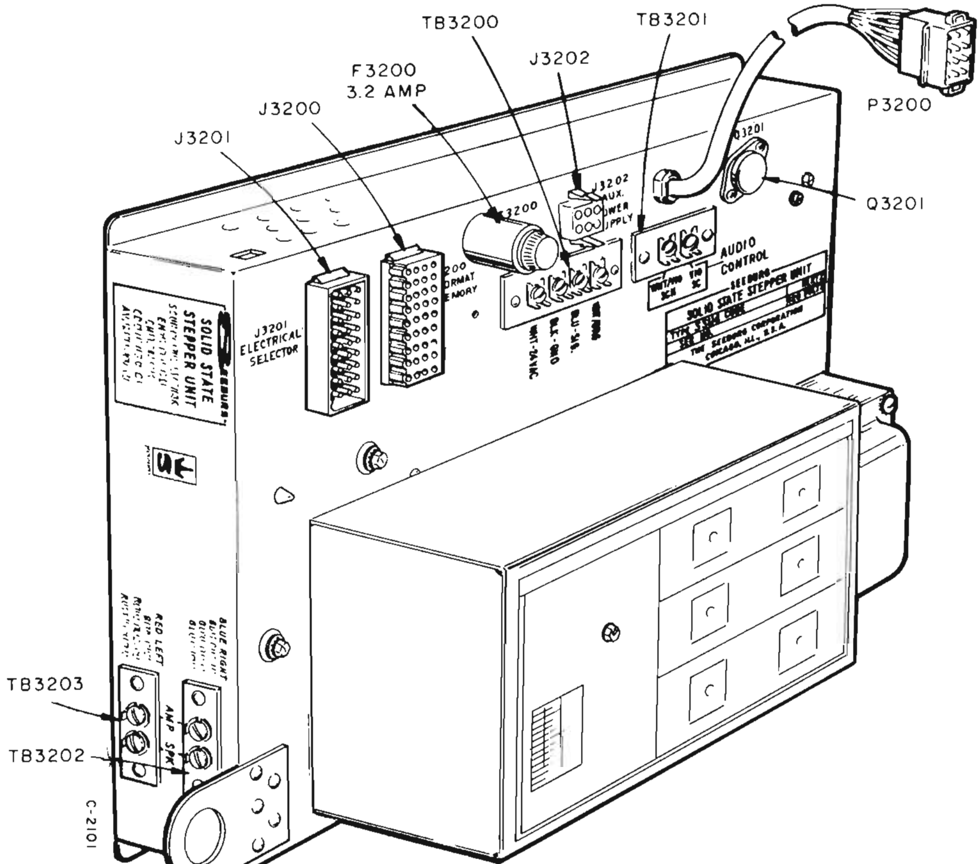


SPU5–Y (Code F Units using D.C. Imp./Seq. Relay)



SOLID STATE STEPPER UNIT KITS

(For use with SX100 & SL100 Model phonographs)



SOLID STATE STEPPER UNIT KIT.

Type SSU4K. SSU4K-5 and SSU4K-H5

The Type SSU4K Stepper Kits are used in con-verting this model phonograph to incorporate re-mote selection of records when used in conjuction with any of the Seeburg "100" or "160" Wall-O-Matics. The kits include the SSU4 Stepper Units, a cam action terminal block and all cables and hardware necessary for installation into the phonograph. The kits include the following:

Part No.	Description
	Stepper Unit
73-487803	10-Station Terminal Block
81-317716	Terminal Block Label
31-960969	No. 8 x 1 inch Sheet Metal Screws
70-317715	Remote Control Cable Assembly
70-317718	Amplifier Cable Assembly
70-317979	Speaker Cable Assembly
70-317989	Cable Assembly
31-961042	No. 8-32 x ¾ inch Self Tapping Screws
31-971164	No. 8 x 5/8 inch Wood Drilling Screws
81-317708	Universal Stepper Conversion Sheet
33-802199	Wire Ties
81-317980	Caution Label

The kits are installed as described in the following procedure:

1. Cut the GRY wire in the stepper unit at the points indicated in Figure 1. Tape the end of the wire where indicated.

2. Install the special Caution Label (Part No. 317980) on the front of the stepper unit. This will serve as a reminder that it has been converted for use in this Model phonograph and should not be used in any other phono-graph.

3. Revise wiring on No. 1 and No. 2 contact plates (see Figure 2) for the Wall-O-Matics to be used in the system.

4. Install the 10-Station Terminal Block, (Part No. 487803) and Terminal Block Label (Part No. 317716) on the cabinet wall as shown in Figure 3. Use two No. 8 x 1 inch sheet metal screws (Part No. 960969).

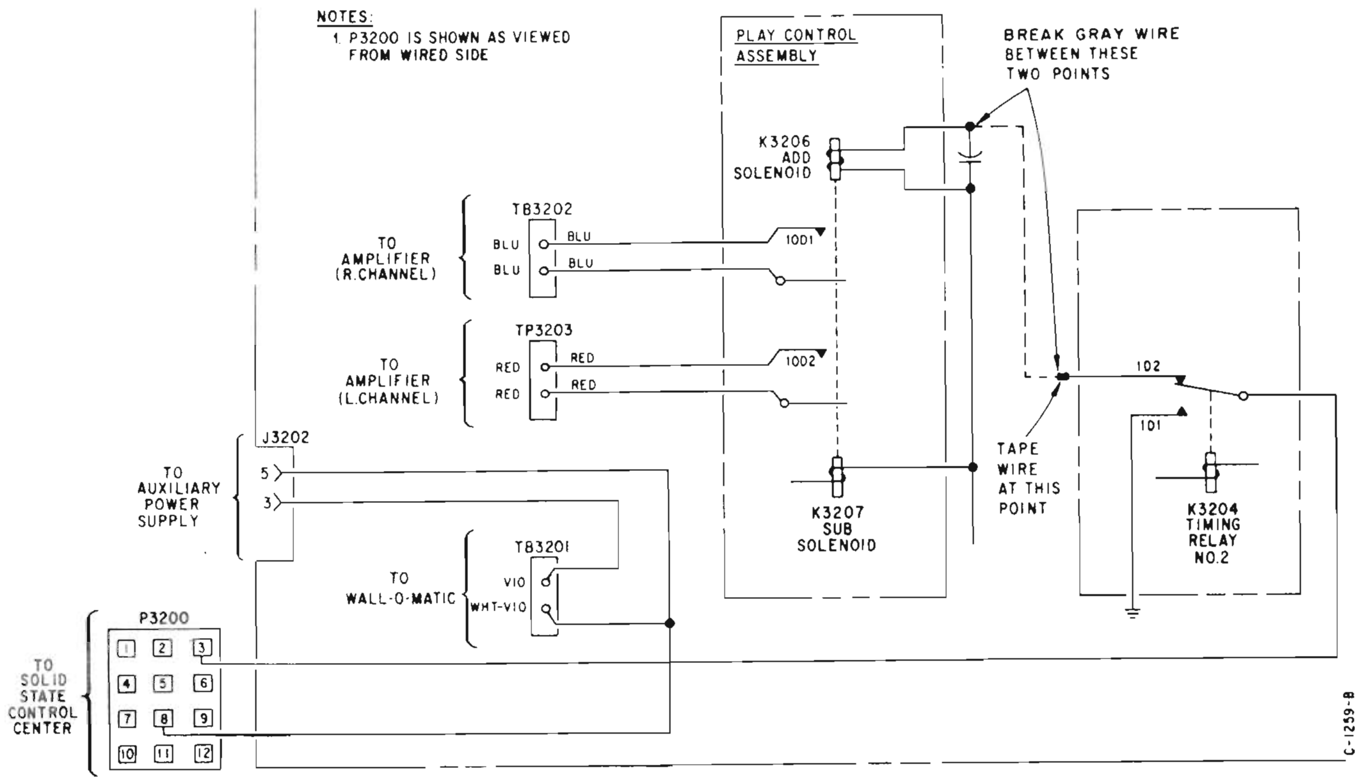


Figure 1. Stepper Circuit Modification

5. Mount the Stepper Unit on the floor, on the left hand side of the cabinet.
Use two wood screws (Part No. 971164).

6. Plug the 12-contact connector cable from the stepper unit into the 12-contact socket (blue) in the Solid State Control Center.

7. Disconnect the Tormat Plug from the Electrical Selector and plug it into the Stepper Unit.

8. In Cable Assembly, Part No. 317989, reverse the wires connected to pins 29 and 33 (in male plug). Plug one end of the Cable Assembly into the Stepper Unit and the other end into the Electrical Selector.

9. Connect the Remote Control Cable Assembly (Part No. 317715) between the Terminal Block and the Stepper, as shown in Figure 3.

10. Connect the Wall-O-Matic Cables to the 10-Station Terminal Block.

11. Reinstall the terminal board cover on the Stepper Unit.

12. Make a selection at the Wall-O-Matic to test the operation of the installation.

NOTE:
The Seeburg Solid State Stepper Unit is capable of supplying power for up to six Wall-O-Matics. A Type RPS8K-56 Remote Power Supply Kit, Part No. 509056, should be used for every six additional units.

SEEBURG WALL-O-MATICS

"100" and "160" Wall–O–Matics may be used with this Model phonograph (equipped with the Solid state Stepper Kit, SSU4K) by making adjustments in the SSU4 Stepper Unit as detailed in the UNIVERSAL STEPPER CONVERSION INSTRUCTIONS, Part No. 81–317708, furnished with the Stepper Kit.

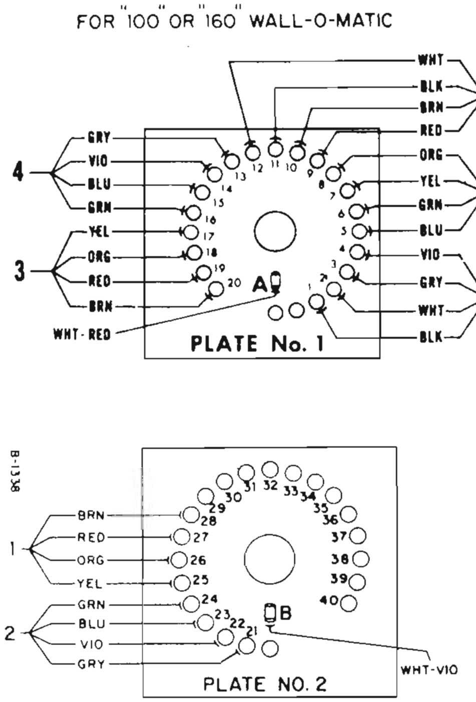


Figure 2. Contact Plate Wiring Detail

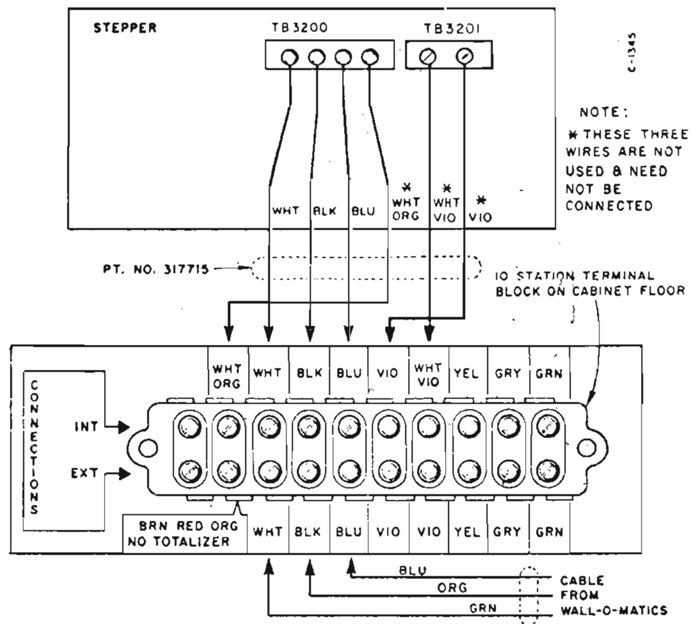


Figure 3. Stepper and Wall–O–Matic Connections.